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Irish primary school teachers' experiences, training and knowledge in first aid

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ABSTRACT

Injury and illness can occur in children. Since children spend a considerable amount of time in school, teachers must have the ability to assist when required. However, no research to date has examined Irish primary school teachers' experiences, training and knowledge in first aid. An online survey ($n = 587$) examined Irish male and female primary school teachers previous first aid experiences, training and knowledge. Respondents generally showed high levels of both previous first aid training and exposure to events requiring first aid. In addition, most teachers knew the location of the school's first aid equipment and were aware of their school's first aid policy. However, many felt ill-equipped to deal with these situations, particularly for serious incidents and over a third of teachers were not currently certified in first aid. While teachers displayed good overall knowledge, gaps were evident. The findings demonstrate the need to develop a multilevel school strategy to ensure teacher proficiency and school preparedness in managing situations requiring first aid.

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KEYWORDS

Medical emergency; AED; CPR; defibrillation

Introduction

The World Health Organisation acknowledges the link between health and education and the important role schools play in ensuring student health and well-being (World Health Organization 2021). Injuries and illness can occur in children, requiring teachers to be prepared to assist them (Adib-Hajbaghery and Kamrava 2019; Masih et al. 2014). In Ireland, 1 in 4 primary school children annually sustain an injury, with 27.8% of all recreational and 13.9% of sporting injuries occurred at primary school (O'Connor et al. 2020). Most injuries were sprains, bruises and strains and occurred following a fall or while running. Fractures accounted for 15% of all injuries. Trauma and choking are predominant causes of death in children (Eisenburger and Safar 1999). In addition, 20% of children who suffer from allergies have an allergic reaction during school hours (Adib-

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Hajbaghery and Kamrava 2019). These findings highlight the importance of teacher proficiency in first aid and paediatric basic life support.

The World Health Organisation's guideline on school health services indicates that provision of first aid in schools and training school staff on first aid are essential supports required in schools (World Health Organization 2021). The purpose of first aid is to preserve life, alleviate suffering, reduce risk of further illness or injury and promote recovery (Singletary et al. 2015). The assisting actions and initial care provided for an acute injury and illness is defined as first aid (Singletary et al. 2015). Following injury, illness or medical emergency, timely first aid administration can reduce complications, cost of treatment and mortality in children (Al-Robaiaay 2013).

Those attending these situations need appropriate knowledge, understanding and competency to assist and provide first aid when required. School nurses, while frequent in other countries (Baisch et al. 2011; Pommier et al. 2010), have not been introduced in Ireland. Thus, Irish teachers are primarily responsible for dealing with first aid and emergency events during school. However, previous international research suggest that teachers feel ill-equipped to deal with situations that require first aid as they lack first aid training (Galindo et al. 2018). In Ireland, each individual Board of Management of the school is responsible to ensure school safety conforms with the Safety, Health and Welfare at Work Act (2005). A suitable number of occupational first aiders, depending on the size of the school, are required (Health and Safety Authority, Kilkenny Education Centre, and Department of Education 2013). For example, for a school with 100–399 persons, one occupational first aider is required and must recertify every two years. However, while one named first aider is required, typically in the day-to-day schooling, the individual teacher dealing with a child requiring first aid deals with the issue. Schools must also have a school policy outlining appropriate steps for teachers to take when dealing with an accident, injury or illness.

Teacher first aid knowledge has been found to be unsatisfactory (Adib-Hajbaghery and Kamrava 2019; Al-Robaiaay 2013; Başer et al. 2007; Parim 2015); just 12%, 31% and 56% of Turkish primary school teachers knew the correct action to take following a nose bleed, abrasion and haemorrhage, respectively (Başer et al. 2007). While teacher first aid knowledge has been examined in Iran (Adib-Hajbaghery and Kamrava 2019), Turkey (Başer et al. 2007), Baghdad (Al-Robaiaay 2013) and India (Hosapatna et al. 2019; Joseph et al. 2015), no research has examined Irish primary school teachers general first aid knowledge to date. Competency and confidence levels of primary school teachers internationally in performing basic life support has been found to be low (Mptos et al. 2013). However, this also has yet to be examined in an Irish context.

First aid training has been demonstrated to improve not only teachers' knowledge (Adib-Hajbaghery and Kamrava 2019), but also their confidence and ultimate care (Li et al. 2014; Masih et al. 2014). However, just 40% of Iranian (Adib-Hajbaghery and Kamrava 2019) and 47% of Indian teachers (Joseph et al. 2015) had previous first aid training and 69% of Flemish teachers had basic life support training (Mptos et al. 2013). Younger teachers (Başer et al. 2007) and those with previous experiences where they provided first aid (Adib-Hajbaghery and Kamrava 2019) have demonstrated greater knowledge. Thus, consideration of other factors, such as previous first aid training, previous experiences of providing first aid, gender and age, is important.

This study examined primary school teachers' experiences, training and knowledge in first aid. It also determined if there were differences in first aid knowledge between:

gender, previous first aid training, time since first aid training and previous exposure to incidents requiring first aid or emergency incidents and investigated teachers' confidence in their general first aid ability and first aid training completed. In addition, this study examined if there was a relationship between first aid knowledge and age, years of teaching experience and confidence in their own general first aid ability.

Materials and methods

Participants

A cross sectional study was completed on fully qualified primary school teachers currently working in the Republic of Ireland. A sample size calculation, (Raosoft.com ("Sample Size Calculator" 2021)) indicated a requirement of 381 participants, based on a 5% margin of error, population proportion of 50%, 95% Confidence Interval and population size of 37,839 (Department of Education 2020).

Instrumentation

An anonymous online survey was developed and adapted for an Irish context from previous research (Abernethy et al. 2003; Adib-Hajbaghery and Kamrava 2019; Alkhotani et al. 2019; Dursun et al. 2018; Mpotos et al. 2013; Qureshi et al. 2018; Sönmez, Uskun, and Pehlivan 2014; Toner et al. 2007; Tzimpoulas et al. 2020) and current Irish pre-hospital emergency care clinical practice guidelines (Pre-Hospital Emergency Care Council 2016; 2018). The survey consisted of 38 questions in four sections (supplementary material 1). A list of definitions was included at the start of the survey.

Section 1 consisted of 11 questions participants' demographics (age, gender, teaching experience in years, level of education) and their school [setting (urban/rural), classification (DEIS/Non-DEIS), location, class size]. The participants' accessibility to an AED and first aid box, and knowledge of their location was queried. Previous experiences managing first aid and emergency incidents in school was also investigated.

Section 2 entailed 10 questions. This explored their experiences and views of first aid training and their current level and timing of certification. For those without first aid training, the reason for this was examined. Participants' views on whether training should be mandatory and incorporated into teacher education were gathered. Participants then completed two 5-point Likert scales ranging from very low to very high on 9 statements relating to their perceived ability to provide first aid, interest in future first aid education, and competency in managing incidents. Their knowledge and perceptions of first aid school policy were investigated. Finally, their knowledge of guidelines and past experiences dealing with a student returning to school following a concussion were examined.

Section 3 focused on teachers' knowledge of the most correct action to take following a first aid or emergency incident. Section 3A comprised of 9 questions and queried their knowledge of: basic life support, traumatic dental injuries, fractures, head injuries, sprains, epileptic seizures and wound management. Section 3b entailed 8 different

scenario-based questions requiring teachers to pick their most important actions when prioritising responses.

Procedures

Survey face validity was examined using a two-round modified Delphi approach where experts commented on the relevance, clarity, and syntax of each question. They also suggested question modifications or additional questions to include. Eleven experts [academics with expertise in teacher education ($n = 3$) and first aid and emergency care ($n = 2$) and 6 primary school teachers with greater than 10 years teaching experience] were recruited and all completed both rounds. The survey was then piloted on 9 primary school teachers with a mean completion time of $10.5 \pm .1$ min (range: 9–13 min).

Ethical approval was gained by the university's research ethics committee and informed consent was obtained prior to participation. Data collection was completed (February–April 2020) online. The Irish National Teachers' Organisation, which is the trade union for primary school teachers, included the survey invite in their distributed monthly newsletter. Social media was utilised to advertise the survey. Recruitment emails were also sent to 71 primary school principals across all counties in Ireland requesting them to distribute it to their teachers.

Data analysis

Data were analysed in Excel (Version 15, Microsoft Corporation, USA) and SPSS (Version 23, IBM Corp, USA). Descriptive statistics were calculated. Total knowledge score consisted of 17 questions (max score = 17).

Pearson product correlations were conducted to examine the relationship between total knowledge score and 1) age, 2) years of teaching experience and 3) their confidence in their own general first aid ability. The strength of the correlation strength was evaluated using the following cut-off points: small ($r = .10-.29$), medium ($r = .30-.49$) and large ($r = .50-1.0$) (Cohen 1988). Between groups differences for total knowledge scores were calculated using independent samples t-tests for: (1) gender, (2) exposure to an incident requiring first aid, (3) exposure to an emergency, and (4) first aid training that took place greater or less than two years previously. One-way ANOVA's examined differences in total knowledge scores between: (1) first aid training level completed, and (2) time since first aid training. In addition, a one-way ANOVA investigated teachers' confidence in their general first aid ability and first aid training level completed. Effect size was calculated using eta squared and classified as small (.01), moderate (.06) and large (.14) (Cohen 1988).

Results

Demographics

A total of 592 participants completed the survey, 5 were removed as they were special needs assistants which left 587 in the sample. The mean age was 33.7 (SD = 9.2, range = 21–69) years. Table 1 displays respondents' demographics. Most teachers were

Table 1. Respondent demographics.

		% (n)
Gender	Female	91.1 (535)
	Male	8.5 (50)
	Transgender	0.2 (1)
	Did not disclose	0.2 (1)
Socioeconomic school classification	DEIS	26.2 (155)
	Non-DEIS	72.9 (428)
	Private	0.7 (4)
Language school classification	Primarily English speaking	90.3 (530)
	Primarily Irish speaking	9.7 (57)
Location school classification	Urban	69.8 (410)
	Rural	30.2 (177)
Gender school classification	Mixed	86.0 (505)
	All-girls	8.2 (48)
	All-boys	5.8 (34)
Level of education	Undergraduate degree	61.2 (359)
	Master's degree	27.9 (164)
	Postgraduate diploma	10.2 (60)
	Doctorate degree	0.3 (2)
	Other	0.3 (2)

female (90.5%) and taught in a non-DEIS school (72.4%). Teachers had a mean of 10.6 (SD = 9.2, range = 0–48) years teaching experience and on average 22.7 (SD = 7.8) pupils were their class.

Accessibility of first aid equipment, school policy and past experiences with first aid and emergency situations

Over half of respondents reported they had immediate access to both an AED and first aid box (53.8%, $n = 315$), 43.9% ($n = 257$) had access to a first aid box only and 0.9% ($n = 5$) to an AED only. Most respondents knew the location of first aid/emergency equipment (88.7%, $n = 520$), and these were primarily kept at the school reception (88.7%, $n = 520$) or the physical education hall (11.3%, $n = 66$).

Most teachers were familiar with their school's first aid policy (71.4%, $n = 419$), knew where to find it (71.4%, $n = 419$) and had previously read it (78.0%, $n = 387$). While most believed their school policy was adequate in dealing with a first aid or medical emergency incident (65.3%, $n = 340$), 34.7% ($n = 181$) did not. Teachers most frequently reported that they felt the school policy should be discussed/reviewed at the beginning of each school year in staff meetings and there should be more visibility, accessibility and awareness of the school policy. Few teachers have previously dealt with or were aware of the return to school guidelines for a pupil following concussion (23.5%, $n = 138$).

Respondents predominantly (82.2%, $n = 486$) had experienced a minor first aid incident and most had assisted with an incident (79.7%, $n = 396$). However, 1.0% ($n = 5$) did not assist with a first aid incident due to their lack of confidence, 3.8% ($n = 19$) due to a lack of training and 15.5% ($n = 77$) as someone else assisted. Regarding emergency situations, 30.3% ($n = 178$) had been exposed to one and 23.5% ($n = 139$) assisted with one. However, 0.8% ($n = 5$) did not assist in an emergency due to low confidence and 2.0% ($n = 12$) as they were not trained how to. Most minor incidents or emergency situations occurred in the schoolyard (96.7%, $n = 564$).

Table 2. Frequency of minor incidents and emergencies.

Variable (number of respondents for that variable)	Daily % (n)	Weekly % (n)	Monthly % (n)	Annually % (n)	Rarely % (n)	Never % (n)
Minor incidents	42.8 (248)	42.4 (246)	11.0 (64)	1.4 (8)	2.4% (14)	0.0 (0)
Minor incidents						
Fainting (<i>n</i> = 539)	0.2 (1)	0.7 (4)	9.8 (53)	18.6 (100)	52.9% (284)	17.8 (96)
Human Bites (<i>n</i> = 536)	0.6 (3)	2.2 (12)	12.3 (66)	14.7 (79)	43.3% (232)	26.9 (144)
Insect bites/stings (<i>n</i> = 541)	0.0 (0)	0.4 (2)	10.4 (56)	37.9 (205)	41.8% (226)	9.6 (52)
Ligament sprains (<i>n</i> = 544)	0.6 (3)	4.6 (25)	17.5 (95)	30.5 (166)	35.7% (194)	11.2 (61)
Muscle tears (<i>n</i> = 533)	0.0 (0)	0.6 (3)	8.1 (43)	18.0 (96)	45.2% (241)	28.1 (150)
Nose bleeds (<i>n</i> = 574)	2.3 (13)	23.7 (136)	49.3 (283)	17.8 (102)	7.0% (40)	0.0 (0)
Stomach aches (<i>n</i> = 583)	33.8 (197)	47.5 (277)	16.1 (94)	1.5 (9)	0.9% (5)	0.2 (1)
Wounds/bleeds (<i>n</i> = 570)	23.3 (133)	50.5 (288)	19.3 (110)	2.8 (16)	3.9% (22)	0.2 (1)
Emergencies	0.2 (1)	0.8 (4)	7.2 (38)	11.9 (63)	54.8% (291)	25.2 (134)
Emergencies						
Anaphylaxis (<i>n</i> = 526)	0.0 (0)	0.4 (2)	4.2 (22)	5.9 (31)	30.0% (158)	59.5 (313)
Asthma attacks (<i>n</i> = 533)	0.2 (1)	1.3 (7)	9.6 (51)	20.6 (110)	41.8% (223)	26.5 (141)
Burns (<i>n</i> = 527)	0.0 (0)	0.4 (2)	4.2 (22)	6.1 (32)	23.0% (121)	66.4 (350)
Choking (<i>n</i> = 528)	0.2 (1)	0.0 (0)	4.5 (24)	7.0 (37)	31.8% (168)	56.4 (298)
Concussion (<i>n</i> = 532)	0.2 (1)	0.6 (3)	8.6 (46)	18.4 (98)	43.6% (232)	28.6 (152)
Dental injuries (<i>n</i> = 534)	0.4 (2)	1.1 (6)	10.5 (56)	24.3 (130)	43.1% (230)	20.6 (110)
Diabetic episodes (<i>n</i> = 528)	1.3 (7)	2.7 (14)	7.3 (38)	12.5 (66)	31.8% (168)	44.5 (235)
Dislocations (<i>n</i> = 526)	0.0 (0)	0.0 (0)	3.8 (20)	9.9 (52)	38.7% (204)	47.4 (250)
Epileptic seizures (<i>n</i> = 527)	0.8 (4)	1.7 (9)	5.9 (31)	9.9 (52)	34.9% (184)	46.9 (247)
Fractures (<i>n</i> = 523)	0.0 (0)	0.0 (0)	7.3 (38)	20.1 (105)	47.8% (250)	24.9 (130)
Nut allergies (<i>n</i> = 525)	1.7 (9)	2.3 (12)	6.9 (36)	13.0 (68)	40.6% (213)	35.6 (187)
Poisoning (<i>n</i> = 524)	0.0 (0)	0.0 (0)	3.1 (16)	5.0 (25)	15.3% (80)	76.7 (402)

Most participants experienced minor first aid incidents daily (42.8%, *n* = 248) or weekly (42.4%, *n* = 246). Teachers most frequently dealt with stomach aches and wounds/bleeds. Asthma attacks, dental injuries and fractures were the most common emergency situations that occurred (Table 2).

First aid training

The most common training level of respondents was an AED and CPR course (23.9%, *n* = 140), followed by a one-day training course (22.7%, *n* = 133), several-hours first aid course (19.5%, *n* = 114), three day first aid course (6.3%, *n* = 37), CPR course only (2.1%, *n* = 12), five-day first aid course (1.9%, *n* = 11) and AED course only (0.7%, *n* = 4). However, 15.7% (*n* = 92) of participants had received no first aid training. Only 3.9% (*n* = 23) of participants had received first aid training during their university education, with 31.7% (*n* = 186) receiving training at an in-service (continuous professional development) course, 23.9% (*n* = 140) by a guest speaker at the school and 16.5% (*n* = 97) seeking the training themselves outside of work/education. Almost all teachers (97.4%, *n* = 572) believed that first aid training should be included during their university education and 89.4% (*n* = 524) believe that first aid training should be mandatory. Respondents suggested mandatory training would increase competency (*n* = 122), improve employability (*n* = 77) and essential given they are responsible for student wellbeing (*n* = 69).

Of those with no current first aid training, reported reasons included: not being provided by their school (53.4%, *n* = 87), cost (12.3%, *n* = 20), lack of time (11.7%, *n* = 19) and unsure of where to find a course (9.2%, *n* = 15). Just over a third of participants had over 2 years since their last first aid training (Table 3).

Table 3. Time since last first aid training.

Time since last first aid training	% (n)
0–6 months	18.4% (108)
7–12 months	16.5% (97)
13–23 months	21.0% (123)
2–5 years	23.2% (136)
6–10 years	7.5% (44)
11–15 years	2.4% (14)
More than 15 years	2.6% (15)
Not applicable	8.5% (50)

Table 4. Current first aid readiness, interest in future training and self-reported confidence in first aid and medical emergency situations.

	Very Low	Somewhat Low	Moderate	Somewhat High	Very High
Current first aid readiness and interest in future training					
Own first aid ability (<i>n</i> = 586)	4.4 (26)	18.6 (109)	43.7 (256)	26.5 (155)	6.9 (40)
Importance of first aid competence (<i>n</i> = 585)	0.0 (0)	0.9 (5)	3.9 (23)	23.8 (139)	71.5 (418)
Desire for future education (<i>n</i> = 587)	1.4 (8)	0.5 (3)	5.8 (34)	29.5 (173)	62.9 (369)
School first aid & emergency readiness (<i>n</i> = 587)	3.1 (18)	10.4 (61)	32.2 (189)	37.0 (217)	17.4 (102)
Self-reported confidence					
Minor Incidents (<i>n</i> = 581)	0.2 (1)	2.4 (14)	7.7 (45)	33.7 (197)	56.2 (330)
CPR and AED use (<i>n</i> = 580)	19.6 (115)	20.0 (117)	26.5 (155)	23.9 (140)	10.1 (59)
Fainting (<i>n</i> = 579)	4.3 (26)	13.7 (80)	32.1 (188)	31.8 (186)	17.9 (105)
Muscle strain or joint sprain (<i>n</i> = 581)	6.1 (36)	12.8 (75)	34.8 (204)	30.5 (179)	15.8 (93)
Choking (<i>n</i> = 581)	15.3 (90)	19.1 (112)	33.9 (193)	24.5 (144)	8.2 (48)

Views on first aid

Although 71.3% of teachers rated the importance of teachers being competent in dealing with an emergency as ‘very high’, only 6.9% reported their own first aid ability as ‘very high’ and 26.6% as ‘high’ (Table 4). While 18.6% and 4.4% reported their first aid ability as ‘somewhat low’ or ‘low’, the majority reported a ‘very high’ (62.9%) or ‘high’ (29.5%) desire to attend first aid and illness management training in the future. Over half of respondents rated their school as somewhat highly (37.0%) or very highly (17.4%) equipped to deal with an emergency. A significant difference in teachers’ confidence in their own general first aid ability was found between the different groups according to first aid training level with a large effect size ($f(8, 575) = 13.75, p < .01, \eta^2 = .16$). Post hoc comparisons observed that those with no first aid training (mean = 2.42, SD = .99), displayed significantly lower confidence than those that previously completed a three-day (mean = 3.62, SD = .83), AED and CPR (3.39, SD = 0.82, one-day (mean = 3.11, SD = .84), and several-hours (mean = 3.10, SD = .83) first aid courses ($p < .001$).

First aid knowledge

Overall, most teachers were aware of the correct action to take in the scenarios presented (Table 5). However, many teachers were unaware of the correct depth and rate required for chest compressions in CPR, the priority action to take if a student had fainted and the order in which to assess vital signs in an unresponsive student.

Table 5. Teachers' correct and incorrect responses in the individual knowledge questions.

	Correct answer % (n)	Incorrect answer % (n)
Priority action following epileptic seizure	98.8 (580)	1.2 (7)
Open fracture: not to push the fractured bone	96.8 (568)	3.2 (19)
Concussion: keep child awake	94.0 (552)	6.0 (35)
Irish emergency contact number	93.0 (546)	7.0 (41)
Priority action following a wound	92.3 (542)	7.7 (45)
Direct pressure on bleed	91.0 (534)	9.0 (53)
CPR location of adult chest compressions	90.3 (530)	9.7 (57)
Priority action following an ankle sprain	84.3 (495)	15.7 (92)
Head position during a nosebleed	83.6 (491)	16.4 (96)
Priority action following a wrist fracture	75.8 (445)	24.2 (142)
CPR number of chest compression and breaths recommended	70.9 (416)	29.1 (171)
Priority action following a serious head trauma	66.4 (390)	33.6 (197)
Priority action in a choking incident	62.2 (365)	37.8 (222)
Avulsed tooth storage	60.5 (355)	39.5 (232)
Vital signs assessment procedure	42.9 (252)	57.1 (335)
Priority action following a student fainting	23.9 (140)	76.1 (447)
CPR depth and rate of chest compressions	10.9 (64)	89.1 (523)

CPR, cardiopulmonary resuscitation.

Participants' mean total knowledge score was 12.40 (SD = 1.86, range: 7–17) out of a maximum of 17. While no significant relationship was observed between age and total knowledge scores ($p > .05$), a small positive correlation was observed between better total knowledge scores and those with greater teaching experience ($r = .10$, $p = .03$) and greater confidence in their own general first aid ability ($r = .25$, $p < .001$). No significant differences were observed between gender or previous exposure to a minor first aid incident or emergency ($p > .05$).

There was a significant difference in total knowledge score between groups based on first aid training level with a moderate effect size ($F(8,576) = 6.72$, $p < .001$, $\eta^2 = .09$). Post-hoc comparisons found that those attending a three-day course (mean = 13.2, SD = 1.6, $p < .001$), several-hours first aid course (mean = 12.7, SD = 1.6, $p < .001$), or an AED and CPR course (mean = 12.6, SD = 1.8, $p < .001$) scored significantly higher than those who had received no training (mean = 11.6, SD = 2.0). No other post-hoc significant differences between level of first aid training were observed. No difference in knowledge scores existed between participants who had trained in first aid less than two years ago or more than two years ago ($p > .05$).

Discussion

This study aimed to identify primary school teachers' experiences, knowledge and training in first aid. Irish primary school teachers reported that they frequently experienced incidents in school that required first aid. All teachers were exposed to a minor first aid incident at least once, four in five teachers dealt with a minor first aid incident and just over a fifth assisted with an emergency situation. In fact, minor incidents frequently occurred with two fifths of teachers reporting dealing with these situations daily or weekly. Thus, first aid proficiency is essential for all Irish primary school teachers so that they can competently manage these events. First aid training therefore can play a key role in ensuring primary school teachers are equipped with the necessary skills required. Welcomingly, most teachers (84.3%) had conducted some form of

first aid training in the past, which is higher than international research from India (47.3%) (Joseph et al. 2015). It is also higher than previous research from Ireland, where 80.6% of Irish primary school teachers in 2007 did not have a recognised first aid qualification (Griffin, Jones, and Hunter 2007). While first aid training needs to be regularly renewed, with a hands-on focus to ensure staff are keeping up-to-date of new requirements and maintain their practical first aid competency (Behairy and Al-Batanony 2015; Meissner, Kloppe, and Hanefeld 2012), a third of teachers in the current study had not completed first aid training in the last two years, primarily due to schools not providing the training, cost and being unsure of where to find a course. The Pre-hospital Emergency Care Council of Ireland, which sets the standards for education and training for pre-hospital emergency care in Ireland, recommend engaging in a refresher course every two years to maintain competency. Therefore, schools should consider organising first aid training courses for their staff every two years in order to maintain their first aid proficiency. However, mid-way through data collection, Irish COVID-19 restrictions came into place, which would have led to the cancellation of any face to face first aid training and could potentially have impacted those that had first aid training booked at that time.

Stomach aches, wounds/bleeds and nose bleeds were the most frequently encountered minor incidents by Irish primary school teachers, along with asthma attacks, dental injuries and fractures that were the most common serious incidents. This was similar to previous research in India, where wounds, fractures/sprains and epistaxis (nose bleeds) were encountered (Joseph et al. 2015). School policy and any first aid training for teachers should ensure that they have adequate content to support teachers assisting with students presenting with these conditions. While the majority (71.4%) of Irish primary school teachers had experienced a situation whereby a pupil sustained a concussion during school, over three quarters of Irish primary school teachers were not aware of return to school guidelines for a pupil following a concussion. In fact, one in five teachers in the current study reported that they experienced a concussive event annually. Concussion symptoms typically last up to 4 weeks and a graduated return to school is recommended for children (McCrory et al. 2017). First aid training for teachers and each school's policy should contain information on how to manage a concussion but also how to support students during their return to school with academic accommodation (McCrory et al. 2017).

Welcomingly, the majority of teachers had access to and knew the exact location of first aid equipment in their school and were familiar with their school policy. Accessibility and familiarisation with what to do in a situation that requires first aid or a medical emergency is important to ensure the correct steps are taken quickly and efficiently. This is of particular importance in an emergency care situation, such as sudden cardiac arrest, where early CPR and quick defibrillation with an AED within 3–5 min following sudden cardiac arrest can increase survival rates from 41 to 74% in adults (Drezner, Asif, and Harmon 2011). Unfortunately, 45.4% of respondents in the current study did not have immediate access to an AED, which was similar to previous research in the US prior to the introduction of state legislation making the presence of an AED mandatory in Connecticut (Thornton et al. 2020). While the risk of sudden cardiac arrest is low in children, it can also occur in the adults who work and visit the school (Olympia, Wan, and Avner 2005). Thus, schemes to introduce AEDs and their upkeep to all schools would be a worthwhile initiative serving not only the school but the wider general community.

Two in seven teachers were not familiar with their school policy and did not know where to find the policy if required. Incidents that require first aid can be high stress situations where a child may be in distress. Teachers' reasoning ability during a high stress situation like this can be temporarily inhibited (Van de Velde et al. 2009). Consequently, ensuring teachers are extremely clear on the appropriate actions they should take and have previously practiced these situations is essential to guarantee the situation is dealt with competently and in a timely manner. Teachers in the current study suggested that to increase awareness of the policy amongst the school community, it should be reviewed annually at the beginning of the school year at their staff meetings and the policy should be provided with more visibility and accessibility in the school itself. Just over a third of teachers felt that their school policy was not adequate in dealing with a first aid or medical emergency event. Ensuring that school policies contain accurate information and are detailed enough to support teachers during common potential incidents is critical. Schools should regularly review their policy, ensure it contains up to date information on how to manage these incidents and gain feedback from teachers in the school on any additions or edits that would prove useful.

Sufficient first aid knowledge is essential for teachers to competently manage a situation requiring first aid. Teachers in the current study displayed good overall knowledge of the correct actions to take following most minor first aid incident or serious medical emergency. This is in contrast to previous findings internationally in primary school teachers, where their overall knowledge was lacking (Adib-Hajbaghery and Kamrava 2019; Al-Robaiaay 2013; Başer et al. 2007; Parim 2015). However, gaps in Irish primary school teachers' knowledge of first aid was evident. The majority of teachers did not recognise the correct depth and rate of CPR compressions or the correct action to take if a student fainted. This is critical information as high quality chest compressions have a positive effect on the ultimate outcome (Meaney et al. 2013). In addition, one third did not know the correct action to take during a choking incident. Choking is a common cause of death in children (Eisenburger and Safar 1999) and as teachers supervise students when eating their lunch in school on a daily basis, being competent in dealing with a choking event is essential. Thus, first aid training for teachers should focus on addressing these knowledge deficits. Those with greater teaching experiences displayed significantly better knowledge scores. However, the correlation was found to be small. In contrast to our finding, previous research has found that younger teachers displayed better first aid knowledge (Başer et al. 2007). The current study's findings may have differed, as teachers with more experience may have come across more incidents requiring first aid during their time teaching and consequently were more familiar with the appropriate action to take. Similar to previous research (He, Wynn, and Kendrick 2014; Van de Velde et al. 2009; Yeung et al. 2011), teachers with previous first aid training displayed significantly better knowledge scores than those without. Professional development education for teachers plays an important role in preparing teachers to meet the changing demands of the educational environment, keep up-to-date on new innovations in education and has been shown to directly improve teaching quality (TALIS 2021). While recent needs analysis research from Turkish schools found that first aid training was the most consistently reported professional development training opportunity desired by both teachers and administrators (Aydin et al. 2021), teachers unfortunately typically will only have the time and funding to engage in a limited number of

professional development opportunities annually and this may impact the uptake of first aid training among teachers. First aid training is not regularly incorporated into teacher training programmes in Ireland currently and the vast majority of Irish primary school teachers in this study believe it should be made mandatory for all teachers. The Department of Education, who is responsible for teacher training and regulations in schools, should consider the inclusion of mandatory teacher education on first aid that must be engaged with every two years and ensure that schools are required to have first aid training readily available for all staff.

Other factors besides knowledge may inhibit teachers from assisting when required (Van de Velde et al. 2009). Teachers own perceptions of their first aid ability may influence their actions and those with sufficient confidence in their competency are better able to assist in first aid or emergency incidents (Eisenburger and Safar 1999). In the current study, just a third of teachers rated their own first aid ability as high or very high, indicating that teachers predominantly feel ill equipped to handle these situations currently. Teachers also displayed greater perceived confidence in dealing with minor incidents than more serious ones such as choking or CPR and AED use. Similar to previous Irish research (O'Connor et al. 2020), those without first aid training displayed lower confidence in their own general first aid ability. While most teachers reported that their school preparedness was somewhat or very high, a third regarded it as moderate and 1 in 10 somewhat low. Schools should develop a clear and comprehensive first aid and emergency strategy. This strategy should focus not only on enhancing individual teacher's first aid competence and confidence, but also the wider school preparedness. This includes availability of first aid equipment and an AED and a comprehensive readily available school policy and emergency action plans that are widely disseminated to all teachers and administration staff. Designated regular deadlines for staff to receive repeat first aid training and the school policy to be reviewed and edited as appropriate is also required.

There were a number of limitations in this study. The sampling strategy may have led to bias, whereby primary school teachers with an interest or previous experiences in first aid or medical emergencies may be over represented. More females than males completed the survey. However, this is reflective of the greater female to male ratio of primary school teachers in Ireland, whereby in 2015, 87% of teachers were female (Central Statistics Office 2016). In addition, our respondents demographics were similar to the general demographics reported for primary school teachers in 2020. In our study, teachers' primarily worked in predominantly English-speaking (90.3%) and non-DEIS schools (72.9%) which is largely reflective of teachers' nationally (89.6%, 78.8%) (Department of Education 2021). Average class sizes were also similar to the national average for 2020 (22.7 vs 23.3 pupils) (Department of Education 2021). This study focused on mainstream primary school teachers only and so was not generalisable to other primary school staff such as special needs assistants or administrative staff. These school staff may also deal with first aid situations in the school and so this study may not be fully reflective of the schools preparedness for a first aid scenario. As this is a cross-sectional study the views and actions stated by primary school teachers in this survey format may not accurately reflect the actions they would take during an authentic first aid or medical emergency situation.

Conclusions

This study found that Irish primary school teachers frequently need to utilise first aid in their occupation. Thus, ensuring teachers in all schools in the Republic of Ireland have adequate first aid proficiency to manage these events is important. While most teachers knew the location of the school's first aid equipment, had previous first aid training and were aware of their schools first aid policy, most teachers felt ill-equipped to handle these situations and displayed greater confidence in dealing with minor incidents than serious ones. In addition, just over a third of teachers were not currently certified in first aid. Most teachers' knowledge of the correct action to take in a situation requiring first aid was good, however gaps in their knowledge were evident. Thus, implementing a multi-level strategy that focuses on not only ensuring all teachers are competent to deliver first aid but that their school policy and emergency action plans are sufficient and disseminated widely to all school staff would be welcome. Regular mandatory training for teachers should be provided and regular familiarisation, at least annually, with their school policy and emergency action plans should be conducted. In addition, the Irish Department of Education should consider introducing first aid training as an obligatory component in all primary school teacher education.

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No potential conflict of interest was reported by the author(s).

Data availability statement

Data is available upon reasonable request.

Human subjects approval statement

This study was approved by the Dublin City University research ethics committee.

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